

**ABSTRACT****FLUID SENSOR AND METHODS**

A fluid sensor for use in an environment having an ambient temperature has a  
5 field-effect transistor (FET) comprising a functionalized semiconductor nanowire, an integral heater disposed proximate to the field-effect transistor to heat the field-effect transistor to an elevated temperature relative to the ambient temperature, and integral thermal insulation disposed to maintain the field-effect transistor at the elevated temperature.